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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/643,278

08/18/2003

Michael R. Beylor

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11/17/2004

Patent Docket Administration
RAYTHEON COMPANY
Bldg. EO/E4/N119
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EXAMINER

SHINGLETON, MICHAEL B

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/643,278	Applicant(s) BEYLOR ET AL.	
	Examiner Michael B. Shingleton	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE Three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-23 is/are rejected.
- 7) ☒ Claim(s) 12, 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee et al. 6,147,561 (Rhee) in view of Suzuki et al. 5,258,626 (Suzuki).

Figures 2-11 and the relevant text of Rhee discloses a method for generating a low phase noise reference and the associated low phase noise oscillator having a frequency generator 22 that generates a reference signal at an oscillation frequency f_{out} responsive to an control signal that is obtained from the output of the phase detector 14'. Figures 2-11 and the relevant text of Rhee also disclose a delay line element 202 that delays the reference signal from the generator 22 thereby producing a "low phase-noise time-delayed reference signal". Clearly, the control signal is obtained from the phase difference between the low phase noise time delayed reference signal and the phase shifted reference signal obtained from the output of the delay element 200. Note claims like claim 1 only requires that there be "a phase-shifted reference signal" and does not set forth any specific structure to provide such. Furthermore, the claims do not set forth any specific form that the phase shifted reference signal must be. Thus a fair and reasonable interpretation of the claims would be that any "phase-shifted reference signal" could be used. The delay line element 202 contributes to the low phase noise (See column 7 around line 6). The delay line 200 clearly introduces a phase shift the reference signal obtained at node 13. Rhee does recognize that the delay line should be of the type that introduces the least amount of phase noise. Note that the term "should" is not a requirement. Accordingly, other delay lines can be used (See column 7, around line 5). Rhee only prefers digital delay lines for their low phase noise. Rhee, however, is silent on the use of

super conductive delay lines. Rhee is also silent on making the phase shifter, i.e. the delay element 200 to be variable and provide a phase shifted reference signal having "approximately" a ninety degree phase difference from the time-delayed reference signal. Providing the delay of approximately 90 degrees is merely the selection of the optimum or workable range that involves but routine skill in the art. Also to make an element variable or use the variable form of an element has long been held to not to present a "patentable advance" (See *In re Stevens*, 101 USPQ 284 (CCPA 1954)).

Super conductive delay lines are well known to be one that introduces the least amount of phase noise that is due to their superconductive nature. In fact superconductive YBCO on MgO delay lines cooled to cryogenic temperatures are art recognized equivalents to non-superconductive delay lines as recognized by Suzuki. See Figure 5 of Suzuki.

Thus one of ordinary skill in the art at the time the invention as made would have found it obvious to replace the analog delay line of Rhee with a super conductive one so as to provide for high speed and low loss as taught by Suzuki. One of ordinary skill in the art would have been additionally motivated to use a superconductive delay line because of the art recognized equivalence of the non-superconductive and superconductive delay lines and because the superconductive delay line is well known to minimize the phase noise introduced by such element that happens to be a goal of Rhee. Also to provide for the 90 degree phase shift mentioned above would have been obvious to one of ordinary skill in the art at the time the invention was made because this is the mere selection of the optimum or workable range that involves but routine skill in the art. Likewise, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a variable delay/phase shifter for the reference signal in Rhee as it has been long held that making an element adjustable where needed does not present a patentable advance. One of ordinary skill in the art would have been further motivated to make the combination so as to be able to adjust the delay or phase shift so as to tune or calibrate this delay as is conventional in the art to do so.

Note that applicant calls MgO a semiconductor and therefore the MgO of the combination made obvious above is considered a semiconductor. Also note the coplanar structure of the combination made obvious above. Also note the use of liquid nitrogen in the combination made obvious above to cool the superconductor device down to the cryogenic temperature of around 70 degrees Kelvin. Note that the patterns of Suzuki are seen as "random" for applicant fails to provide a figure showing exactly what applicant means by random and the detailed description describes a random pattern as one that is arranged to "reduce and/or offset coupling between adjacent waveguide structures on the substrate." This means that the pattern is not random but has a specific structure that is necessary to obtain this recited function. Thus, Suzuki's patterns are seen as "random" for these waveguide arrangements reduce and/or offset coupling between adjacent waveguide structures on the substrate as compared to other waveguide structures. Rhee is silent on the exact structure of the VCO or "frequency generator".

A SAW VCO is a conventional structure and an art recognized equivalent form of VCO. Accordingly, it would have been obvious to one of ordinary skill in the art to replace the VCO of Rhee with a SAW VCO because, as the Rhee reference is silent on the exact VCO circuit one of ordinary skill would have been motivated to utilize any art recognized equivalent VCO such as the conventional SAW VCO for the VCO of Rhee.

Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee et al. 6,147,561 (Rhee) and Suzuki et al. 5,258,626 (Suzuki) as applied to claims 1-10 and 20-22 above, and further in view of Carr 6,377,315 (Carr).

All the same reasoning as applied above and the following: The circuitry of Rhee and Rhee in combination with Suzuki is for a larger system i.e. it is meant to be a component of a larger system. Applicant sets forth in claims 14 plus a "receiver" wherein these claims rely on the details of the subcombination for patentability, namely the oscillator structure. The basic receiver structure is conventional. Carr shows and recognizes that the basic backbone of a receiver including Doppler radar

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systems, i.e. the reference source and mixer. See Figure 54 of Carr. The reference source is advantageously a phase locked loop.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the pll of Rhee/Suzuki in a conventional receiver structure including one that detects low Doppler radar signal because, as the references are silent on the exact use of the component one of ordinary skill in the art would have been motivated to use the component in any art recognized receiver system that employs reference oscillators such as the conventional receiver arrangement like that of Carr. The deviations recited by claims like claim 15 is an obvious consequence of the combination made obvious above.

Rhee and Rhee in combination with Suzuki are both silent on the amount of delay provided by the delay element. This is merely the selection of the optimum or workable range and as such a selection involves routine skill in the art the selection of 5 to 15 microseconds being part of the workable/optimum range would have been obvious to one of ordinary skill in the art at the time the invention was made.

Mitsuo JP 62272619A discloses the use of delay lines and phase comparators in combination. Ruggiero discloses the superconductor form of the tapped delay line. Koh et al. discloses that superconductive delay lines have the added advantage over convention non-superconductive delay lines of ultra high speed and low loss.

Allowable Subject Matter

Claims 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770. The examiner can normally be reached on Tues-Fri from 8:30 to 4:30. The examiner can also be reached on alternate Mondays. The examiner normally has the second Mondays of the bi-week off.

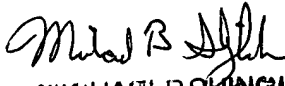
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS

November 09, 2004


MICHAEL B SHINGLETON
PRIMARY EXAMINER
GROUP ART UNIT 2817